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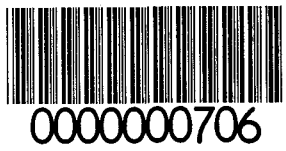

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BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF ARIZONA PUBLIC SERVICE COMPANY FOR A HEARING TO DETERMINE THE FAIR VALUE OF THE UTILITY PROPERTY OF THE COMPANY FOR RATEMAKING PURPOSES, TO FIX A JUST AND REASONABLE RATE OF RETURN THEREON, TO APPROVE RATE SCHEDULES DESIGNED TO DEVELOP SUCH RETURN AND FOR APPROVAL OF PURCHASED POWER CONTRACT.	DOCKET NO. E-01345A-03-0437 **NOTICE OF SERVICE**

Arizona Corporation Commission
DOCKETED

JAN - 7 2004

DOCKETED BY

NOTICE IS HEREBY GIVEN that the undersigned counsel for Federal Executive Agencies, did serve via U.S. Mail the Direct Testimony of Matthew I. Kahal on Behalf of Federal Executive Agencies.

RESPECTFULLY SUBMITTED this 7th day of January, 2004.

BY: Rebecca Salisbury
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STATE OF ARIZONA

BEFORE THE

CORPORATION COMMISSION

In the Matter of the Application of Arizona Public Service Company for a Hearing to Determine the Fair Value of the Utility Property of the Company for Ratemaking Purposes, to Fix a Just and Reasonable Rate of Return Thereon, to Approve Rate Schedules Designed to Develop Such Return, and for Approval of Purchased Power Contracts	))))))))	Docket No. E-01345A-03-0437

DIRECT TESTIMONY OF

MATTHEW I. KAHAL

ON BEHALF OF THE

FEDERAL EXECUTIVE AGENCIES

JANUARY 2004

EXETER

ASSOCIATES, INC.

5565 Sterrett Place

Suite 310

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STATE OF ARIZONA

BEFORE THE

CORPORATION COMMISSION

In the Matter of the Application of Arizona Public Service Company for a Hearing to Determine the Fair Value of the Utility Property of the Company for Ratemaking Purposes, to Fix a Just and Reasonable Rate of Return Thereon, to Approve Rate Schedules Designed to Develop Such Return, and for Approval of Purchased Power Contracts	))))))))	Docket No. E-01345A-03-0437

I. QUALIFICATIONS

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Matthew I. Kahal. I am employed as an independent consultant, retained by the consulting firm Exeter Associates, Inc. My business address is 5565 Sterrett Place, Suite 310, Columbia, Maryland 21044.

Q. PLEASE STATE YOUR EDUCATIONAL BACKGROUND.

A. I hold B.A. and M.A. degrees in economics from the University of Maryland and have completed all course work and examination requirements for the Ph.D. degree in economics. My areas of academic concentration include industrial organization, economic development and econometrics.

Q. WHAT IS YOUR PROFESSIONAL BACKGROUND?

A. I have been employed in the area of energy, utility and telecommunications consulting for the past 25 years working on a wide range of subjects. Most of my work over the years has focused on utility integrated planning, power plant licensing, environmental compliance, purchase power contracts and a variety of utility ratemaking issues. This has included extensive work on cost of capital and utility financial studies. Much of my

professional work in recent years has shifted to electric utility restructuring, mergers and competition.

Prior to entering consulting, I served on the faculties of the University of Maryland (College Park) and Montgomery College, teaching a range of undergraduate courses in economics and business.

Appendix A, which is attached to my testimony, provides a statement of my qualifications.

Q. HAVE YOU PREVIOUSLY TESTIFIED AS AN EXPERT WITNESS?

A. Yes. I have testified before approximately two dozen state and federal utility regulatory commissions in more than 250 separate regulatory cases. My testimony has addressed a wide range of topics including rate of return, need for power, rate design, integrated resource planning, purchase power contracts, stranded costs, utility mergers, and other policy and ratemaking issues. These cases have encompassed electric, gas, telephone and water utilities. I also have testified before the U.S. Congress, Committee on Ways and Means, on proposed tax legislation affecting utilities. These cases are listed in Appendix A.

II. OVERVIEW

A. Recommendation Summary

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS CASE?

A. I have been retained by the Federal Executive Agencies (FEA) to evaluate the rate of return request in this case for Arizona Public Service Company (APS or the Company). As part of that assignment, I have prepared an independent study of the cost of common equity relating to the Company's electric service rate base.

Q. WHAT ARE YOU RECOMMENDING AT THIS TIME?

A. I am recommending that this Commission set the authorized rate of return on common equity at 9.85 percent. If the capital structure and cost of debt proposed in this case by APS is employed, this would result in an overall rate of return applicable to an original cost rate base of 7.61 percent. This is the Company's estimated capital structure as of year-end 2003, inclusive of APS' debt incurred as part of the PWEC financing, and it should be updated when actual year-end capitalization data are available. My testimony briefly discusses the Company's capital structure proposal. My recommendations on rate of return are summarized on Schedule MIK-1, pages 1 of 1.

Q. HOW DOES YOUR RECOMMENDATION IN THIS CASE COMPARE WITH THE COMPANY'S PROPOSAL?

A. The Company's rate of return on equity request is sponsored by Dr. Charles Olson, its outside cost of capital expert. Dr. Olson recommends a return on common equity of 11.5 percent for APS' jurisdictional electric operations. Using Dr. Olson's return on equity recommendation, Company witness Froggatt calculates overall returns of 8.67 percent using year-end 2002 capitalization and 8.35 percent using year-end 2003 capital structure (inclusive of the PWEC debt).

Q. HOW DID DR. OLSON OBTAIN HIS RECOMMENDED RETURN ON EQUITY?

A. He applied the Discounted Cash Flow (DCF) model to a proxy group of electric companies and to APS' parent, Pinnacle West. He obtained "yield plus growth" market return results of 11.07 to 11.58 percent for proxy electric companies (page 22) and 10.18 percent for Pinnacle West on a stand-alone basis (page 23).

Q. GIVEN THESE DCF RETURN CALCULATIONS, HOW DID HE DEVELOP HIS RECOMMENDATION?

A. Dr. Olson first calculated the market return requirement using the standard DCF model. He next presents risk premium data, which he states indicate a return range of 12.0 to 12.5 percent. The combination of his DCF and risk premium evidence, coupled with the asserted need for stock issuance cost recovery, leads Dr. Olson to conclude that a 11.25 to 11.75 percent range is a reasonable fair rate of return on equity at this time for APS.

Q. HOW DID YOU OBTAIN YOUR RECOMMENDED 9.85 PERCENT RETURN ON EQUITY RECOMMENDATION?

A. I conducted two DCF studies, one using Dr. Olson's group of proxy electric companies and a second using an alternative proxy group of electric utility companies. These two studies produced midpoint returns of 9.4 and 9.7 percent, respectively. I also conducted a capital asset pricing model (CAPM) study, and using conservative assumptions I obtained a cost of equity range of 9.7 to 10.5 percent, with a 10.1 percent midpoint. Given this range of study results, a reasonable equity return award for APS at this time is 9.85 percent.

The midpoints of the three costs of equity studies (i.e., the two DCF studies and the CAPM study) average to about 9.7 percent. If some recognition is given to stock issuance expense (the parent company issued common stock in 2002), then I believe a

range of 9.7 to 10.0 percent should be considered. My recommendation of 9.85 percent is the midpoint of that range.

Q. WHY IS YOUR RECOMMENDATION ON RETURN ON EQUITY SO MUCH LOWER THAN THAT OF DR. OLSON?

A. Dr. Olson recommends 11.5 percent even though his DCF evidence ranges from 10.18 percent to 11.58 percent (i.e., a midpoint of 10.88 percent). This compares to APS' currently authorized return of 11.25 percent. However, common equity costs have declined significantly since the time period of Dr. Olson's DCF study, i.e., December 2002 to May 2003, and this explains much of the difference. For example, he reports a dividend yield for his proxy group of 5.92 percent during that six-month period. Updating for the last half of 2003, the average dividend yield for his proxy group is 5.1 percent, a reduction of 0.8 percentage points. Capital costs also have declined significantly since APS' previous rate proceeding which established the 11.25 percent authorized return on equity.

B. Capital Structure

Q. WHAT CAPITAL STRUCTURE IS APS PROPOSING IN THIS CASE?

A. As shown on Company Schedule D-1, APS presents an end of test year capital structure (i.e., as of 12/31/02) with 50.2 percent common equity and 49.8 percent long-term debt. In combination with Dr. Olson's 11.5 percent return on equity, this produces an overall return of 8.67 percent. I would note that the "test year" 50.2 percent common equity ratio is substantially higher than the average equity ratio for Dr. Olson's proxy group.

APS proposes a second capital structure based on projected end of year 2003 capitalization. This contains 45.1 percent common equity and the remainder long-term debt. Although this is clearly more forward looking than the end of test year 2002 capital structure, it is my understanding that APS links the use of this capital structure with

authorization to move its PWEC generating unit into rate base. This updated capital structure, combined with Dr. Olson's 11.5 percent return on equity, produces an overall return of 8.35 percent.

Q. WHAT IS YOUR RECOMMENDATION?

A. I recommend, on a provisional basis, the use of the projected 12/31/03 capital structure. As shown on my Schedule MIK-1, in conjunction with my 9.85 percent return on equity, this produces an overall return on (original cost) rate base of 7.61 percent.

Q. IS YOUR RECOMMENDATION LINKED TO THE RATE BASE TREATMENT OF THE PWEC GENERATING UNITS?

A. No, I have not analyzed that issue, and FEA takes no position at this time on the rate basing of those generating assets.

Q. WHY DO YOU PREFER THE END OF 2003 CAPITAL STRUCTURE?

A. In addition to the fact that this is a more forward-looking capital structure, it also is more reasonable than the 50.2 percent common equity ratio reflected in the end of test year capital structure. As both Dr. Olson and I have shown, the 45.1 percent equity ratio is much closer to the proxy group average than the 50.1 percent year-end 2002 value. (See my Schedule MIK-3, which shows 2003 common equity ratios for the proxy companies.) These proxy companies were used to establish the cost of equity applicable in this case to APS. Finally, I have examined the recent capital structure data for Pinnacle West on a consolidated basis, and the common equity ratio for the consolidated corporation approximates (or is slightly less than) the projected year-end 2003 value of 45.1 percent. For all of these reasons, I believe the end-of-year 2003 capital structure, as shown on Schedule D-1, is more appropriate than the more expensive end of test year capital structure.

Q. YOU HAVE DESCRIBED THIS RECOMMENDATION AS PROVISIONAL. PLEASE EXPLAIN WHY.

A. In early 2004, prior to the close of the record, I would expect that APS will have the actual year-end 2003 capitalization values. It would be appropriate at that time to update the projections for the actual values.

C. Capital Cost Trends

Q. YOU HAVE STATED THAT CAPITAL COSTS HAVE DECLINED RELATIVE TO THE TIME PERIOD EMPLOYED BY DR. OLSON. CAN YOU DOCUMENT THAT TREND?

A. Yes. Schedule MIK-2 presents capital cost trend data over the past decade through November 2003. This includes general inflation, short-term (i.e., 3-month) Treasury yields, ten-year Treasury yields and yields on single-A rated utility bonds (Moody's). This schedule shows that capital market cost conditions in 2003 are quite favorable compared with past years. Inflation currently is running at less than 2 percent, ten-year Treasury yields are in the 4 to 4.5 percent range and utility bond yields have averaged about 6.5 percent in recent months. These low interest rates reflect the absence of inflation (and, more importantly, favorable inflationary expectations) and an accommodative monetary policy conducted by the Federal Reserve Board (Fed).

Q. YOUR SCHEDULE SHOWS THAT LONG-TERM INTEREST RATES ARE QUITE LOW AT THE PRESENT TIME. DOES THIS ALSO APPLY TO THE COST OF EQUITY?

A. Yes, I believe so. The factors that cause low long-term interest rates (e.g., favorable inflation conditions, an accommodative Fed, etc.) also favorably affect the cost of equity, and there is no reason to believe this would not apply to APS, as well. There is another factor that favorably affects the cost of equity but does not have a similar beneficial effect

on bonds – federal tax policy. Earlier this year, Congress enacted tax legislation reducing income tax rates on both capital gains and on common stock dividends. Lower tax rates mean that investors are willing (or should be willing) to accept lower (pre-tax) returns to hold common stocks. I believe my DCF analysis captures these cost of equity reducing tax benefits. This is because my DCF analysis includes market data from a time period after the enactment of these very favorable income tax reductions.

One of the purposes of the recent tax law changes that lower capital gains and dividend income taxes is to lower the corporate cost of capital, and I believe that this legislation has succeeded in doing so. Thus, to the extent that the stock pays dividends and is held in a taxable account, the tax law change has lowered the investor's return requirement. As an analogy, one need only look at the relatively low interest rates on tax-exempt bonds, as compared with fully taxable bonds. I would note that Dr. Olson's market data mostly reflect a time period prior to these tax law changes.

Q. WHAT IS THE CURRENT NEAR-TERM OUTLOOK FOR CAPITAL COSTS?

A. The outlook in the near term for capital costs is relatively favorable, although there is an expectation that interest rates could increase somewhat as part of a general economic recovery. According to the Blue Chip Economic Indicators "Consensus" forecast (December 10, 2003), yields on ten-year Treasury Notes are expected to increase from current levels of about 4.3 percent to 4.8 percent in calendar 2004. Inflation in 2004 is expected to remain under control, a mere 1.5 percent as measured by the GDP deflator and 1.9 percent as measured by the Consumer Price Index. This outlook is the average of approximately 40 major forecast organizations surveyed by Blue Chip.

Q. DOES YOUR RECOMMENDATION IN THIS CASE REFLECT THAT OUTLOOK?

A. Yes, I believe so. I have attempted to use reasonably recent stock market data, investor analyst earning forecasts and interest rates. Those recent market data and forecasts would take into account the outlook for U.S. economic recovery in the near term.

III. THE DCF STUDIES

A. Using the DCF Model

Q. WHAT STANDARD ARE YOU USING TO DEVELOP YOUR RETURN ON EQUITY RECOMMENDATION?

A. As a general matter, the ratemaking process is designed to provide the utility an opportunity to recover its (prudently-incurred) costs of providing utility service to its customers, including the reasonable costs of financing its (used and useful) investment. Consistent with this "cost-based" approach, the fair and appropriate return on equity award for a utility is its cost of equity. The utility's cost of equity is the return required by investors (i.e., the "market return") to acquire or hold that company's common stock. A return award greater than the market return would be excessive and would overcharge consumers for utility service.

Although the concept of cost of equity may be precisely stated, its quantification poses difficulties. The market cost of equity cannot be directly observed (i.e., investors do not directly state their return requirements), and it therefore must be estimated using analytic techniques.

Q. IS THE COST OF EQUITY A FAIR RETURN AWARD?

A. Generally speaking, yes it is. A return award commensurate with the cost of equity provides fair and reasonable compensation to utility investors and normally should allow the utility to successfully finance its operations on reasonable terms.

Q. WHAT DETERMINES A COMPANY'S COST OF EQUITY?

A. It should be understood that the cost of equity is essentially a market price, and as such it is determined by the supply and demand forces operating in financial markets. In that regard, there are two key factors that determine the cost of equity. First, a company's cost of equity is determined by the fundamental conditions in capital markets (e.g., the

outlook for inflation, tightness of monetary policy, investor behavior, etc.). The second factor (or set of factors) is the business and financial risk profile of the company in question. For example, APS' status as a regulated monopoly, dedicated to providing utility electric service (regarded as an "essential service") would imply low business risk and therefore a relatively low cost of equity.

Q. DOES DR. OLSON'S TESTIMONY REFLECT THESE PRINCIPLES?

A. Yes, he incorporates these principles to a large degree. However, he also argues for a return increment in order to target a market-to-book ratio greater than 1.0. I do not fully agree with that perspective and do not believe utility regulation should be targeting any specific stock price. (Indeed, this is not feasible for APS since it is a wholly-owned subsidiary of Pinnacle West and has no market price.)

Q. WHAT METHODS ARE YOU USING IN THIS CASE?

A. I have employed the standard discounted cash flow (DCF) model, which I describe in this section, and the capital asset pricing model (CAPM), which I describe in the next section. I apply the model first to Dr. Olson's proxy companies and second to an alternative proxy group of electric companies.

The DCF model is the approach employed by Dr. Olson, and based on my experience, is the cost of equity method most widely relied upon by state and federal regulatory commissions. Its widespread acceptance is due to the fact that the model is market-based and is derived from standard financial theory. The theory begins by recognizing that any publicly-traded common stock (utility or otherwise) will sell at a price reflecting the discounted stream of cash flows expected by investors. The objective is to estimate that discount rate.

Using certain simplifying assumptions, the DCF formula for dividend paying stocks can be distilled to the following formula:

$K_e = D_o/P_o (1 + 0.5g) + g$, where:

D_o = the current annualized dividend;

P_o = the stock price; and

g = the long-term dividend growth rate.

This is referred to as the constant growth model, because for mathematical simplicity, it is assumed that the growth rate is constant for an indefinitely long time period. While this assumption may be unrealistic in many cases, for traditional utilities (which typically are far more stable than unregulated companies) the assumption may be reasonable.

Q. HOW HAVE YOU APPLIED THIS MODEL?

A. Strictly speaking, the model can be applied only to publicly-traded companies, i.e., companies whose market prices (and hence valuations) are transparently revealed. Consequently, the model cannot be directly applied to APS, and therefore a market "proxy" is needed. The model can be applied to Pinnacle West Corporation, APS' parent, and I have done so in the context of a broader proxy group.

I believe that a (properly selected) proxy group study is likely to be more reliable than a single company study. This is because there is "noise" or fluctuations in stock price (or other) data that cannot always be readily accounted for in a simple DCF study. The use of an appropriate proxy group helps to allow such "data anomalies" cancel out in the averaging process. For the same reason, I prefer to use market data averaged over a period of several months (i.e., six months) rather than "spot" data.

B. DCF Study Using Dr. Olson's Proxy Group

Q. PLEASE DESCRIBE DR. OLSON'S ELECTRIC UTILITY PROXY GROUP.

A. Dr. Olson selected six elective utility holding companies operating in the East, Midwest and Western regions of the U.S. The six companies include:

- Cinergy Corporation
- IDACORP
- OG&E Energy Corp.
- PPL Corp.
- Progress Energy
- Public Service Enterprise

He also conducted a DCF study for Pinnacle West on a stand-alone basis, but instead I have added Pinnacle West to the proxy group. Thus, my reference to Dr. Olson's proxy group throughout this section of my testimony would be the six holding companies listed above, plus Pinnacle West.

Q. IS THIS AN APPROPRIATE PROXY GROUP FOR APS?

A. Not entirely. I question the inclusion of two of the companies, PPL Corp and Public Service Enterprises. These two companies have their utility operations in retail access states (i.e., Pennsylvania and New jersey), but more importantly, the generation assets of both companies have been deregulated. PPL and Public Service today are viewed as major players in the unregulated merchant generation business, both in the Mid-Atlantic region and elsewhere. For this reason, the PPL and Public Service cost of equity may exceed that of APS.

Cinergy Corporation also operates in a retail access state, Ohio, but due to its substantial operations in non-retail access states (Indiana and Kentucky), it continues to be viewed to a large extent as an integrated utility company.

As a result of my concerns regarding Dr. Olson's proxy group, I have selected an alternative group of companies that I describe in the next section.

Q. HOW HAVE YOU APPLIED THE DCF MODEL TO THIS GROUP?

A. I have elected to use a six-month time period to measure the dividend yield component (Do/Po) of the equation. Using the Standard & Poors Stock Guide, I compiled month ending dividend yields for the six months ending December 2003, the most recent data available to me as of this writing. (For December, I used December 30 closing stock prices obtained from the MS Money website.)

I show these dividend yield data on page 2 of Schedule MIK-4. Over the six month time period, the dividend yields for the seven companies ranged from 5.53 in July to 4.61 percent in December, indicating a downward trend over the six-month period.

For DCF purposes, I am relying on the 5.05 percent group and six-month average.

Q. IS 5.05 PERCENT THE FINAL DIVIDEND YIELD?

A. Not quite. Strictly speaking, the dividend yield used in the model should be the value that the investor expects over the next 12 months. Using the standard "half-year" growth rate adjustment technique (which I assume to be 2 percent), the DCF adjusted yield is 5.2 percent (5.05 x 1.02).

Q. HOW HAVE YOU DEVELOPED YOUR GROWTH RATE COMPONENT?

A. Unlike the dividend yield, the growth rate cannot be directly observed but instead must be inferred through a review of available evidence. The growth rate in question is the long-term dividend growth rate, but analysts frequently use earnings growth as a proxy for (long-term) dividend growth. This is because in the long run earnings are the ultimate source of dividend payments to shareholders.

One possible approach is to examine historical growth as a guide to investor expected growth, for example the recent five-year growth rates for earnings, dividends and book value. However, my experience with electric companies has been that these historic measures have become quite volatile in recent years and therefore provide little

(or questionable) useful guidance concerning long-term growth trends. This is not surprising given the electric utility industry's corporate and regulatory restructuring activities during the past five years.

Q. WHAT EVIDENCE, OTHER THAN HISTORICAL TRENDS, HAVE YOU REVIEWED?

A. The DCF growth rate should be prospective, and one particularly useful source of information on prospective growth is the projections of earnings per share (typically five years) prepared by securities analyst. In fact, Dr. Olson appears to rely entirely on this information. There are several publicly available sources of projected earnings prepared by securities analysts.

Schedule MIK-4, page 3 of 4, presents four well-known sources of projected earnings growth rates. Three of the four sources – First Call, Zacks and Standards & Poors (S&P) – provide averages from securities analyst surveys (typically the median value). The fourth, Value Line, is that organization's own estimates. Value Line publishes its estimate of five-year earnings growth using the average annual earnings during 2000 to 2002 to 2006-2008 for growth rate calculation. As this schedule shows, the projected growth rates calculated in this manner tend to be very unstable. I also calculate the five-year growth rate using Value Line's projection for 2007 versus a 2002 base year. These measures appear to support an expected earnings growth range of about 4.0 to 4.5 percent.

Q. DO YOU AGREE WITH DR. OLSON THAT SECURITIES ANALYST ESTIMATES ARE THE ONLY GROWTH RATE EVIDENCE THAT SHOULD BE CONSIDERED?

A. No, there are a number of reasons why investor expectations of <u>long run</u> growth could differ from the limited, five-year estimates. Consequently, while securities analyst

estimates should be considered and given weight, these growth rates should be subject to a reasonableness test and corroboration, to the extent feasible.

On Schedule MIK-4, page 4 of 4, I have compiled Value Line five-year growth rate projections of dividends, book value and retained earnings (the latter for the outyears 2006 to 2008) for each of the proxy companies. (Retained earnings growth measures the growth over time that one would expect from the reinvestment of earnings, i.e., earnings not paid as dividends.) As this schedule shows, dividend growth is quite low (due mainly to a dividend cut by IDACORP) which is captured in the projections data. Projected book value and retained earnings growth rates for the group are 5.3 and 4.7 percent, respectively.

Q. WHAT IS YOUR DCF CONCLUSION?

A. I summarize my DCF analysis on page 1 of Schedule MIK-4. The adjusted dividend yield for the last half of 2003 for this proxy group is 5.2 percent. Available evidence would suggest a DCF growth range of about 4.0 to 5.0 percent (with Value Line providing the upper end of the range and securities analyst earnings growth rates the lower portion of the range). This produces a total return of 9.2 to 10.2 percent, with a midpoint of 9.7 percent.

Q. DO YOU INCLUDE AN ADJUSTMENT FOR FLOTATION EXPENSE?

A. I have not calculated a specific adjustment factor. I am aware, however, that APS' parent raised $200 million in external common equity in 2002. I have therefore taken issuance (or "flotation") costs into account in developing my final 9.85 percent ROE recommendation – a figure higher than my midpoint DCF results.

C. **DCF Study of the Alternative Proxy Group**

Q. HOW DID YOU SELECT THE COMPANIES FOR YOUR ALTERNATIVE PROXY GROUP?

A. The starting point was Dr. Olson's proxy group inclusive of Pinnacle West, but excluding PPL Corporation and Public Service Enterprises due to both companies' corporate restructuring and unregulated merchant generation. I then added four more companies listed in Value Line's Electric Utility West industry group: Black Hills Corporation, Hawaiian Electric, MDU Resources Group and PNM Resources.

With the two deletions and four additions, the proxy group now consists of nine companies. I list these companies on Schedule MIK-3.

Q. HOW WERE THESE FOUR ADDITIONAL COMPANIES SELECTED?

A. I reviewed the Electric Utility West group and eliminated companies that: (a) do not pay dividends; (b) operate in a restructured state (Sempra Energy); (c) are classified by Value Line as "small cap"; (d) have a Safety Rating below (3). It should be noted that Value Line classifies (3) as "average," and rates Pinnacle West (1), which is the highest Safety Rating. In addition, Xcel (the parent of Public Service Company of Colorado) is eliminated due to the bankruptcy of NRG, its merchant plant subsidiary.

Q. DID YOU COMPILE THE DIVIDEND YIELDS FOR THE NINE PROXY COMPANIES?

A. Yes. I compiled this information on Schedule MIK-5, page 2 of 4. The proxy group average dividend yield ranges from 5.07 percent in July to 4.37 percent in December, averaging 4.67 percent for the six-month period. Increasing this by a half year of growth, the adjusted yield becomes 4.8 percent.

Q. WHAT APPROACH DID YOU TAKE IN ESTIMATING THE DCF GROWTH RATE?

A. I examined the same type of information as used in my earlier DCF analysis. Page 3 of Schedule MIK-5 shows the projected five-year earnings growth rates published by Value Line, S&P, First Call and Zacks. For the nine-company group, the measures fall within a narrow range of 4.5 to 4.9 percent. The Value Line alternative measures, shown on page 4, Schedule MIK-5, are similar or slightly lower, i.e., 4.1 percent for retained earnings and 4.6 percent for book value. (Dividend growth for the group is a meager 1.7 percent, but again, this figure is distorted by IDACORP's negative 8 percent growth rate, and therefore is not meaningful.) Based on this information, I adopt a DCF growth range for the group of 4.3 to 4.8 percent.

Q. PLEASE SUMMARIZE YOUR DCF ANALYSIS.

A. The summary is shown on page 1 of Schedule MIK-5. Combining an adjusted yield of 4.8 percent for the six months with a growth range of 4.3 to 4.8 percent, I derive a total return estimate of 9.1 to 9.6 percent, with a midpoint of 9.4 percent. This is somewhat lower than the 9.7 percent midpoint that I obtained using Dr. Olson's proxy group.

Q. IS THE DIFFERENCE BETWEEN YOUR DCF RESULTS AND THOSE OF DR. OLSON EXPLAINED LARGELY BY UPDATING?

A. Yes. The electric utility dividend yields have declined significantly since the time period of his market data, December 2002 to May 2003. In addition, he employed a growth rate range of 5.0 to 5.5 percent based on analyst projections, but the published growth rates have declined somewhat in recent months. I believe the 4.0 to 5.0 percent range (for his proxy group) that I have adopted better reflects current investor expectations.

IV. THE CAPM ANALYSIS

Q. PLEASE DESCRIBE THE CAPM MODEL.

A. The CAPM is a form of the "risk premium" approach and is based on modern portfolio theory. Based on my experience, the CAPM is the cost of equity method most often used in rate cases after the DCF method.

According to this model, the cost of equity (Ke) is equal to the yield on a risk-free asset plus a market risk premium multiplied by a firm's "beta" statistic. "Beta" is a firm-specific risk measure which is computed as the movements in a company's stock price (or market return) relative to contemporaneous movements in the broadly defined stock market. This measures the investment risk that cannot be reduced or eliminated through asset diversification (i.e., holding a broad portfolio of assets). The overall market, by definition, has a beta of 1.0, and a company with lower than average investment risk (e.g., a utility company) would have a beta below 1.0. The "risk premium" is defined as the expected return on the overall stock market minus the yield or return on a risk free asset.

The CAPM formula is:

$$K_e = R_f + \beta (R_m - R_f), \text{ where:}$$

K_e = the firm's cost of equity
R_m = the expected return on the overall market
R_f = the yield on the risk free asset
β = the firm (or group of firms) risk measure.

Two of the three principal variables in the model are directly observable -- the yield on a risk-free asset (e.g., a Treasury security yield) and the beta. For example, Value Line publishes betas for each of the companies that it covers. The difficulty, however, is in the measurement of the market return (and therefore the risk premium), since that variable cannot be directly observed.

Q. HOW HAVE YOU APPLIED THIS MODEL?

A. For purposes of my CAPM analysis, I have used a long-term Treasury yield as the risk free return and the average beta for the eleven proxy group companies. (See Schedule MIK-3 for the company-by-company betas.) In recent months, long-term Treasury yields have been approximately in the range of 5.0 to 5.5 percent, and the beta for the proxy group averages 0.78. Finally, and as explained below, I am using a market return of 11 to 12 percent, although the market return at this time might be somewhat lower than that.

Using these data inputs, the CAPM results are shown on page 1 of Schedule MIK-6. My low-end estimate uses a risk-free rate of 5.0 percent and a stock market return of 11.0 percent:

$$K_e = 5.00\% + 0.78\ (11\% - 5\%) = 9.68\%$$

The upper end uses a risk-free rate of 5.5 percent and a stock market return of 12.0 percent.

$$K_e = 5.5 + 0.78\ (12\% - 5.5\%) = 10.57\%$$

Thus, with these inputs the CAPM provides a return range of 9.7 to 10.6 percent, with a midpoint of 10.1 percent. The CAPM analysis produces results slightly higher than my DCF analysis, and I have factored this into my ROE recommendation for APS.

Q. IT APPEARS THAT A KEY ELEMENT IN YOUR CAPM IS YOUR MARKET RETURN RANGE OF 11 TO 12 PERCENT. HOW DID YOU DERIVE THAT RANGE?

A. Various measures of market return (and therefore the equity risk premium) are shown on page 2 of Schedule MIK-6. These market returns average to about 11.2 percent, and therefore the various risk premium measures average about 6.0 percent, if one assumes a prospective risk-free return of 5.25 percent.

Q. PLEASE DESCRIBE THESE MEASURES.

A. In general, two approaches have been used to obtain either the risk premium or the market return required by the CAPM. The first is to perform a DCF calculation on the overall stock market, and the second approach makes use of historical expected returns data measured over a long time period. Dr. Olson cites to the second method in his testimony, which leads him to assert an equity risk premium (relative to corporate bonds) of 6 percent.

Q. HAVE YOU PERFORMED A STOCK MARKET TOTAL RETURNS ANALYSIS?

A. Yes. Value Line publishes projections for its "Industrial Composite" twice each year, and that information can be used to perform a DCF total return calculation. As of July 2003, Value Line was projecting five-year earnings growth of 7.5 percent and long-term growth from retained earnings of 11.0 percent. Averaging the two measures provides a composite growth rate of 9.25 percent. When combined with Value Line's dividend yield of 1.5 percent for the Composite, the total return is 10.75 percent. The Industrial Composite is a broad measure of the overall stock market, excluding only utilities, financial services and non-North American companies.

Q. WHAT ARE THE HISTORICAL RISK PREMIUM VALUES?

A. Dr. Olson cites Ibbotson as an authority and important data source on historic risk premium data, and I would agree. Based on historic (1926-2002) after-the-fact returns, the stock market risk premium relative to long term Treasury bonds averages 6.4 percent. Combining that value with recent long-term Treasury yields of about 5.25 percent provides a market return of 11.65 percent.

There are reasons, however, for believing that even the 6.4 percent historical premium is too high. A recent research study by Ibbotson and Chen, estimate a long-term historic risk premium of 5.9 percent. The authors estimate this figure using a

supply-side model removing the effects of a rising P/E ratio over the historical period. This analysis acknowledges that the historical trend of rising P/Es served to inflate achieved historical returns and such an increase would not be expected to continue indefinitely into the future. Combining the Ibbotson/Chen 5.9 percent risk premium with a current long-term Treasury yield of 5.25 percent produces an overall stock market return of 11.15 percent.[1]

Q. PLEASE SUMMARIZE THE MARKET RETURN EVIDENCE.

A. These four measures of overall stock market return range from 10.75 to 11.65 percent, validating the assumed range used in my CAPM study on page 1 of Schedule MIK-6 of 11 to 12 percent. These measures imply a stock market risk premium (relative to long-term Treasury bonds) of about 6 percent.

It should be noted that my CAPM results in certain respects are conservatively high, even though my cost of equity estimate is significantly lower than that of Dr. Olson. This is because I have employed the yield on long-term Treasury bonds as the "risk free return," when, in fact, Treasury bonds clearly are not risk free. Investors are well aware of the "interest rate risk" in Treasury bonds (i.e., bond prices will fall if interest rates rise). Moreover, I have made use of "arithmetic" historic average returns, even though investors are undoubtedly aware of both arithmetic and geometric averages. The geometric historic returns are somewhat lower than the arithmetic returns. Providing some recognition of the geometric historic averages, along with the arithmetic historic average, would be reasonable and would lower the CAPM-derived cost of equity.

Since my analysis incorporates both long-term Treasury yields and arithmetic historic returns, the CAPM results should be viewed as conservatively high estimates of

[1] Roger G. Ibbotson and Peng Chen, "Stock Market Returns in the Long Run: Participating in the Real Economy," Financial Analyst Journal (forthcoming).

APS' cost of equity. Hence, greater weight should be given to the lower end of my CAPM range.

Q. DR. OLSON SUGGESTS THAT RISK PREMIUM EVIDENCE SUPPORTS A COST OF EQUITY IN THE RANGE OF 12.0 TO 12.5 PERCENT. HOW DID HE REACH THIS CONCLUSION?

A. Citing data from the 2003 Ibbotson Yearbook, he states that the (arithmetic average) historic risk premium for common stocks versus corporate bonds (1926-2002) is about 6 percent. Since corporate bond yields (published by Moody's) have been in the range of about 6 to 6.5 percent during 2003, Dr. Olson concludes that the risk premium analysis implies an expected return of about 12 to 12.5 percent (i.e., 6% + 6 to 6.5%).

Q. DO YOU AGREE WITH THIS ANALYSIS?

A. As discussed above, a reasonable expectation today is a return range for common stocks generally of about 11 to 12 percent, with the preponderance of the evidence supporting the lower end of that range. Ibbotson and Chen's recent research estimates a historically-based (arithmetic average) risk premium over Treasury (not corporate) bonds at 5.9 percent.

The issue, however, is not just whether the return on common stocks is 11 to 12 percent or 12 to 12.5 percent. Rather, the central problem with Dr. Olson's asserted risk premium result of 12 to 12.5 percent is that he makes no cost of equity distinction between common stocks generally and APS. As an integrated utility, APS is lower in risk than common stocks in general, and therefore has a lower cost of equity. The CAPM is able to capture this risk differential, which Dr. Olson's risk premium result appears to ignore. Thus, even accepting Ibbotson's historical arithmetic mean risk premium, a risk premium (i.e., the CAPM) analysis can support a cost of equity estimate for APS no higher than about 10.5 percent.

V. CONCLUSION

Q. PLEASE SUMMARIZE YOUR PRINCIPAL FINDINGS AND RECOMMENDATIONS ON FAIR RATE OF RETURN FOR APS.

A. Capital costs, and particularly common equity costs, have declined both in recent years and since the time frame (i.e., early 2003) of Dr. Olson's study. This decline should be reflected in the fair rate of return awarded in this case for APS. Based on my analysis, I recommend the following:

- A reasonable return at this time on APS' original cost rate base is 7.61 percent, including a common equity return of 9.85 percent.
- It would be reasonable to use the 12/31/03 APS projected capital structure of 45 percent common equity and 55 percent debt, updated to actuals when available. This capital structure is both reasonable and consistent with that of Pinnacle West consolidated.
- My cost of equity evidence, derived from the DCF and CAPM studies, is a range from about 9 to 10.5 percent, with most of the evidence supporting a cost estimate below 10 percent.
- Dr. Olson's DCF study results range from 10.2 to 11.6 percent, but those returns fall sharply with updating. Dr. Olson's assertion that the risk premium evidence supports a cost of equity for APS in excess of 12 percent is simply incorrect.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

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STATE OF ARIZONA

BEFORE THE

PUBLIC UTILITIES COMMISSION

In the Matter of the Application of Arizona Public Service Company for a Hearing to Determine the Fair Value of the Utility Property of the Company for Ratemaking Purposes, to Fix a Just and Reasonable Rate of Return Thereon, to Approve Rate Schedules Designed to Develop Such Return, and for Approval of Purchased Power Contracts	)	Docket No. E-01345A-03-0437

SCHEDULES ACCOMPANYING THE DIRECT TESTIMONY OF MATTHEW I. KAHAL

ON BEHALF OF THE

FEDERAL EXECUTIVE AGENCIES

JANUARY 2004

EXETER

ASSOCIATES, INC.

5565 Sterrett Place

Suite 310

Columbia, Maryland 20904

ARIZONA PUBLIC SERVICE COMPANY

Rate of Return Summary

(Using Estimated Capital Structure at 12/31/03)

Capital Type	Percent of Total[1]	Cost Rate	Weighted Cost
Short-Term Debt	0.00 %	--	0.00%
Long-Term Debt	54.95	5.76 [1]	3.17
Preferred Stork	0.00	--	0.00
Common Equity	45.05	9.85[2]	4.44
Total	**100.00 %**	--	**7.61%**

[1] Schedule D-1, page 1 of 1.
[2] Schedule MIK-4, page 1 of 4

ARIZONA PUBLIC SERVICE COMPANY

Trends in Capital Costs

	Annualized Inflation (CPI)	10-Year Treasury Yield	3-Month Treasury Yield	Single A Utility Yield
1992	3.0%	7.0%	3.5%	8.7%
1993	3.0	5.9	3.0	7.6
1994	2.6	7.1	4.3	8.3
1995	2.8	6.6	5.5	7.9
1996	3.0	6.4	5.0	7.8
1997	2.3	6.4	5.1	7.6
1998	1.6	5.3	4.8	7.0
1999	2.2	5.7	4.7	7.6
2000	3.4	6.0	5.9	8.3
2001	2.9	5.0	3.5	7.8
2002	1.6	4.6	1.6	7.4
2001				
January	3.7%	5.2%	5.3%	7.8%
February	3.5	5.1	4.9	7.7
March	2.9	4.9	4.5	7.7
April	3.3	5.1	3.9	7.9
May	3.6	5.4	3.7	8.0
June	3.3	5.3	3.5	7.9
July	2.7	5.2	3.5	7.8
August	2.7	5.0	3.4	7.6
September	2.7	4.7	2.9	7.8
October	2.1	4.6	2.2	7.6
November	1.9	4.7	1.9	7.6
December	1.6	5.1	1.7	7.8

ARIZONA PUBLIC SERVICE COMPANY

Trends in Capital Costs (Continued)

	Annualized Inflation (CPI)	10-Year Treasury Yield	3-Month Treasury Yield	Single A Utility Yield
2002				
January	1.1%	5.0%	1.7%	7.7%
February	1.1	4.9	1.7	7.5
March	1.5	5.3	1.8	7.8
April	1.6	5.2	1.7	7.6
May	1.2	5.2	1.7	7.5
June	1.1	4.9	1.7	7.4
July	1.5	4.7	1.7	7.3
August	1.8	4.3	1.6	7.2
September	1.5	3.9	1.6	7.1
October	2.0	3.9	1.6	7.2
November	2.2	4.1	1.3	7.1
December	2.4	4.0	1.2	7.1
2003				
January	2.6%	4.1%	1.2%	7.1%
February	3.0	3.9	1.2	6.9
March	3.0	3.8	1.1	6.8
April	2.1	4.0	1.1	6.6
May	2.1	3.6	1.1	6.4
June	2.1	3.7	0.9	6.2
July	2.1	4.0	0.9	6.6
August	2.2	4.5	1.0	6.8
September	2.3	4.3	1.0	6.6
October	2.0	4.3	0.9	6.4
November	1.8	4.3	1.0	6.4

Source: Economic Report of the President, Economic Indicators, Mergent's Bond Record, Federal Reserve, Statistical Release.

ARIZONA PUBLIC SERVICE COMPANY

Risk Indicators for Proxy Companies

Company	Safety Rating	Beta	2003 Common Equity Ratio	Moody's Bond Rating
Black Hills Corp	3	0.85	44.6%	Baal
Cinergy Corp	2	0.80	42.0	A3
Hawaii Electric Ind.	2	0.60	45.8	--
IDACORP	3	0.80	42.4	A2
MDU Resources Group	1	0.80	59.4	--
OGE Energy Corp	3	0.65	39.7	A1
PNM Resources	2	0.80	47.6	Baa3
PPL Corporation	3	0.90	29.4	Baa1
Progress Energy	2	0.80	41.1	Baa2
Public Service Enterprises	3	0.80	24.6	A3
Average	2.4	0.78	41.7%	--
Pinnacle West	**1**	**0.80**	**45.1%***	**A3**

Source: Value Line Investment Survey 11/14/2003; 10/13/2003; 12/05/2003; and 12/26/03.
Mergent's Bond Record, December 2003.

* This is the APS proposed equity ratio in this case at year-end 2003. The common equity ratios for the proxy companies were calculated inclusive of total debt and estimated year-end 2003 common equity (based on Value Line estimates).

ARIZONA PUBLIC SERVICE COMPANY

DCF Summary for Dr. Olson's
Proxy Group

(1)	Dividend Yield (July-December 2003)	5.05%
(2)	Adjusted Yield (5.05% x 1.02)	5.2%
(3)	DCF Growth Rate	4.0–5.0%
(4)	Flotation Adjustment	0.00%
(5)	Total Return ((2) + (3) + (4))	9.2-10.2%
(6)	Midpoint	9.7%
(7)	**Recommendation**	**9.85%**

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(1) DCF model: $K_e = D_o/P_o (1 + 0.5g) + g$, where

K_e = cost of equity

D_o = current annualized dividend

P_o = current stock price

g = long-term dividend growth rate.

ARIZONA PUBLIC SERVICE COMPANY

Dividend Yields for Dr. Olson's
Proxy Group, * July – December 2003

Company	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Average
Cinergy	5.4%	5.4%	5.0%	5.1%	5.0%	4.8%	5.12%
IDACORP	6.9	7.7	4.7	4.4	4.1	4.0	5.30
OGE	6.7	6.1	5.9	5.8	5.6	5.5	5.93
PPL Corp	3.9	3.9	3.8	3.9	3.8	3.5	3.80
Progress Energy	5.5	5.5	5.0	5.2	5.1	5.1	5.23
Public Service	5.3	5.1	5.1	5.3	5.3	4.9	5.17
Pinnacle West	5.0	5.0	4.8	4.9	4.6	4.5	4.80
Average	**5.53%**	**5.53%**	**4.90%**	**4.94%**	**4.79%**	**4.61%**	**5.05%**

Source: Standard & Poors Stock Guide, August-December 2003 editions. Figures are closing dividend yields for each month. (December yields are as of December 30.)

* This is Dr. Olson's proxy group plus Pinnacle West.

ARIZONA PUBLIC SERVICE COMPANY

Projected Earnings Per Share
Growth Rates for Dr. Olson's
Proxy Group

Company	Value Line*	S&P	First Call	Zacks
Cinergy	3.0% / 6.6%	4%	4.0%	3.7%
IDACORP	(7.0) / 3.1	5	5.0	5.0
OGE	4.5 / 6.9	3	3.0	3.0
PPL Corp.	3.0 / 5.4	5	5.0	5.0
Progress Energy	0.5 / 2.2	4	4.0	4.4
Public Service	1.5 / 1.3	4	4.0	4.1
Pinnacle West	0.5 / 5.5	4	5.0	5.3
Average	**0.9% / 4.4**	**4.14%**	**4.29%**	**4.35%**

Sources: Standard & Poor's Earnings Guide (December 2003); Value Line Investment Survey (11/14/2003; 10/13/2003; 12/5/2003); MSN Money website (Zacks) December 2003; and CNNFN website (First Call) December 2003.

* The first growth rate is Value Line's reported earnings growth rate 2000 – 2002 (average) to 2006 to 2007. The second figure is a calculated compound growth rate 2002 to 2007.

ARIZONA PUBLIC SERVICE COMPANY

Other Value Line Growth Measures
For Dr. Olson's Proxy Group

Company	Dividend	Book Value	2006-2008 Retained Earnings
Cinergy	1.5%	5.0%	4.0%
IDACORP	(8.0)	1.5	3.0
OGE	0.0	3.5	4.5
PPL Corp.	7.0	13.5	8.0
Progress Energy	3.0	4.5	4.0
Public Service	1.0	6.0	6.0
Pinnacle West	5.5	3.0	3.5
Average	**1.4%**	**5.3%**	**4.7%**

Source: Value Line Investment Survey, 11/14/2003; 10/13/2003; and 12/5/2004.

ARIZONA PUBLIC SERVICE COMPANY

DCF Summary for Alternative
Electric Utility Proxy Group

(1)	Dividend Yield (July-December 2003)	4.67%
(2)	Adjusted Yield (4.67% x 1.02)	4.8
(3)	DCF Growth Rate	4.3-4.8%
(4)	Flotation Adjustment	0.00%
(5)	Total Return ((2) + (3) + (4))	9.1-9.6%
(6)	Midpoint	9.4%
(7)	**Recommendation**	**9.85%**

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(1) DCF model: $K_e = D_o/P_o (1 + 0.5g) + g$, where

K_e = cost of equity

D_o = current annualized dividend

P_o = current stock price

g = long-term dividend growth rate.

ARIZONA PUBLIC SERVICE COMPANY

Dividend Yields for the Alternative
Electric Utility Proxy Group
July – December 2003

Company	July.	Aug.	Sept.	Oct..	Nov.	Dec.	Average
Black Hills	3.9%	3.7%	3.9%	3.7%	3.7%	4.1%	3.83%
Cinergy	5.4	5.4	5.0	5.1	5.0	4.8	5.12
Hawaiian Elec.	5.8	5.8	5.7	5.4	5.4	5.2	5.55
Idacorp	6.9	7.7	4.7	4.4	4.1	4.0	5.30
MDU	3.0	3.0	3.0	3.0	2.9	2.8	2.95
OGE Energy	6.7	6.1	5.9	5.8	5.6	5.5	5.93
Pinnacle West	5.0	5.0	4.8	4.9	4.6	4.5	4.80
PNM Resources	3.4	3.4	3.3	3.3	3.3	3.3	3.33
Progress Energy	5.5	5.5	5.0	5.2	5.1	5.1	5.23
Average	**5.07%**	**5.07%**	**4.59%**	**4.53%**	**4.41%**	**4.37%**	**4.67%**

Source: Standard & Poors Stock Guide, August-December 2003. Yields are month ending values, with December yield as of December 30.

ARIZONA PUBLIC SERVICE COMPANY

Projected Earnings Per Share Growth Rates
For Alternative Electric Utility Proxy Group

Company	Value Line*	S&P	First Call	Zacks
Black Hills	0.0% / 3.4 %	6%	6.6%	8.0%
Cinergy	3.0% / 6.6%	4	4.0	3.7%
Hawaiian Electric	0.0% /(1.5)	3	2.8	2.9
Idacorp	(7.0) / 3.1	5	5.0	5.0
MDU	7.5 / 10.2	7	8.0	7.0
OGE Energy	4.5 / 6.9	3	3.0	3.0
Pinnacle West	0.5/5.5	4	5.0	5.3
PNM Resources	(4.5) / 4.4	5	5.0	5.0
Progress Energy	0.5/2.2	4	4.0	4.4
Average	**0.5% / 4.5%**	**4.56%**	**4.82%**	**4.92%**

Sources: Standard & Poor's Earnings Guide (December 2003);
Value Line Investment Survey (11/14/2003; 10/13/2003; 12/5/2003);
MSN Money website (Zacks) December 2003;
CNNFN website (First Call) December 2003.

* The first growth rate is Value Line's reported earnings growth rate 2000 – 2002 (average) to 2006-2008. The second growth rate is a calculated growth rate 2002-2007.

ARIZONA PUBLIC SERVICE COMPANY

Other Value Line Growth Measures for the
Alternative Electric Proxy Group

Company	Dividend	Book Value	2006-2008 Retained Earnings
Black Hills	3.5%	8.0%	5.0%
Cinergy	1.5	5.0	4.0
Hawaiian Electric	0.0	3.5	3.0
Idacorp	(8.0)	1.5	3.0
MDU	5.5	9.0	6.5
OGE Energy	0.0	3.5	4.5
Pinnacle West	5.5	3.0	3.5
PNM Resources	4.5	3.0	3.0
Progress Energy	3.0	4.5	4.0
Average	**1.7%**	**4.6%**	**4.1%**

Source: Value Line Investment Survey, 11/14/2003; 10/13/2003; and 12/5/2004.

ARIZONA PUBLIC SERVICE COMPANY

Capital Asset Pricing Model Analysis

A. Model Specification

$K_e = Rf + \beta (R_m - R_f)$, where:

K_e = cost of equity

R_f = return on risk free asset

R_m = expected return on the stock market

β = beta statistic (non diversifiable risk)

B. Data Inputs

Risk Free Return:	3-month Treasury yield - 1.0% long-term Treasury yield - 5.0 - 5.5%
Market Return:	11-12%
Beta:	0.78 (average of the eleven proxy electric companies)

C. Model Calculations

Low end:	$K_e = 5.00\% + 0.78 (11-5.0) = 9.68\%$
Upper end:	$K_e = 5.50\% + 0.78 (12-5.5) = 10.57\%$
Midpoint:	$K_e = 5.25\% + 0.78 (11.5-5.25) = 10.13\%$

ARIZONA PUBLIC SERVICE COMPANY

Stock Market Returns Estimates

(1) Ibbotson Associates Historical Returns

$K_e = 6.4\% + 5.25 = 11.65\%$

The 6.4% figure is the 1926-2002 arithmetic mean equity risk premium calculated as the historical average return on stocks minus the return on long-term Treasury bonds.

(2) Ibbotson/Chen Supply Side Model

$K_e = 5.9\% + 5.25\% = 11.15\%$

(Ibbotson/Chen estimate an arithmetic risk premium of 5.9% for stocks over the historical time period, 1926-2000, excluding effects of rising P/E ratios.)*

(3) Industrial Composite DCF

$K_e = 1.5\% + 9.25\% = 10.75\%$

(Value Line Industrial Composite, July 18, 2003. Dividend yield is 1.5%, and growth rate is 7.5% for projected earnings and 11.0% for 2006-2008 earnings retention growth. Averaging the 7.5% and 11.0% figures provides a growth rate of 9.25%.)

*The Ibbotson/Chen paper is available at www.ibbotson.com. See "Knowledge Center" and click on "Published Research."

APPENDIX A

QUALIFICATIONS OF

MATTHEW I. KAHAL

MATTHEW I. KAHAL

Mr. Kahal is currently an independent consulting economist, specializing in energy economics, public utility regulation and financial analysis. Over the past two decades, his work has encompassed electric utility integrated resource planning (IRP), power plant licensing and a wide range of utility financial issues. In the financial area he has conducted numerous cost of capital studies and addressed other financial issues for electric, gas, telephone and water utilities. Mr. Kahal's work in recent years has shifted to electric utility restructuring, mergers and competition.

Mr. Kahal has provided expert testimony on more than 200 occasions before state and federal regulatory commissions and the U.S. Congress. His testimony has covered need for power, integrated resource planning, cost of capital, purchased power practices and contracts, merger economics, industry restructuring and various other regulatory policy issues.

Education:

B.A. (Economics) - University of Maryland, 1971.

M.A. (Economics) - University of Maryland, 1974.

Ph.D. candidate - University of Maryland, completed all course work and qualifying examinations.

Previous Employment:

1981-2001 - Exeter Associates, Inc. (founding Principal).

1980-1981 - Member of the Economic Evaluation Directorate, The Aerospace Corporation, Washington, D.C. office.

1977-1980 - Economist, Washington, D.C. consulting firm.

1972-1977 - Research/Teaching Assistant and Instructor, Department of Economics, University of Maryland (College Park).

1975-1977 - Lecturer in Business/Economics, Montgomery College.

Professional Work Experience:

Mr. Kahal has more than twenty years experience managing and conducting consulting assignments relating to public utility economics and regulation. In 1981, he and five colleagues founded the firm of Exeter Associates, Inc. and for the next 20 years he served as a Principal and corporate officer in the firm. During that time, he supervised multi-million dollar support contracts with the State of Maryland and directed the technical work conducted both by Exeter professional staff and numerous subcontractors. Additionally, Mr. Kahal took the lead role at

Exeter in consulting to the firm's other governmental and private clients in the areas of financial analysis, utility mergers, electric restructuring and utility purchase power contracts.

At the Aerospace Corporation, Mr. Kahal served as an economic consultant to the Strategic Petroleum Reserve (SPR). In that capacity he participated in a detailed financial assessment of the SPR, and developed an econometric forecasting model of U.S. petroleum industry inventories. That study has been used to determine the extent to which private sector petroleum stocks can be expected to protect the U.S. from the impacts of oil import interruptions.

Before entering consulting, Mr. Kahal held faculty positions with the Department of Economics at the University of Maryland and with Montgomery College teaching courses on economic principles, business and economic development.

Publications and Consulting Reports:

Projected Electric Power Demands of the Baltimore Gas and Electric Company, Maryland Power Plant Siting Program, 1979.

Projected Electric Power Demands of the Allegheny Power System, Maryland Power Plant Siting Program, January 1980.

An Econometric Forecast of Electric Energy and Peak Demand on the Delmarva Peninsula, Maryland Power Plant Siting Program, March 1980 (with Ralph E. Miller).

A Benefit/Cost Methodology of the Marginal Cost Pricing of Tennessee Valley Authority Electricity, prepared for the Board of Directors of the Tennessee Valley Authority, April 1980.

An Evaluation of the Delmarva Power and Light Company Generating Capacity Profile and Expansion Plan, (Interim Report), prepared for the Delaware Office of the Public Advocate, July 1980, (with Sharon L. Mason).

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"An Assessment of the State-of-the-Art of Gas Utility Load Forecasting," (with Thomas Bacon, Jr. and Steven L. Estomin), published in the Proceedings of the Fourth NARUC Biennial Regulatory Information Conference, 1984.

"Nuclear Power and Investor Perceptions of Risk," (with Ralph E. Miller), published in The Energy Industries in Transition: 1985-2000 (John P. Weyant and Dorothy Sheffield, eds.), 1984.

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"Discussion Comments," published in Impact of Deregulation and Market Forces on Public Utilities: The Future of Regulation (Harry Trebing, ed.), Institute of Public Utilities, Michigan State University, 1985.

An Econometric Forecast of the Electric Power Loads of Baltimore Gas and Electric Company, two volumes (with others), prepared for the Maryland Power Plant Siting Program, 1985.

A Survey and Evaluation of Demand Forecast Methods in the Gas Utility Industry, prepared for the Public Utilities Commission of Ohio, Forecasting Division, November 1985, (with Terence Manuel).

A Review and Evaluation of the Load Forecasts of Houston Lighting & Power Company and Central Power & Light Company -- Past and Present, prepared for the Texas Public Utility Commission, December 1985, (with Marvin H. Kahn).

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"Potential Emissions Reduction from Conservation, Load Management, and Alternative Power," published in Acid Deposition in Maryland: A Report to the Governor and General Assembly, Maryland Power Plant Research Program, AD-87-1, January 1987.

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Toward a Proposed Federal Policy for Independent Power Producers, comments prepared on behalf of the Indiana Consumer Counselor, FERC Docket EL87-67-000, November 1987.

Review and Discussion of Regulations Governing Bidding Programs, prepared for the Pennsylvania Office of Consumer Advocate, June 1988.

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The Costs to Maryland Utilities and Ratepayers of an Acid Rain Control Strategy -- An Updated Analysis, prepared for the Maryland Power Plant Research Program, October 1987, AD-88-4.

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Power Plant Cumulative Environmental Impact Report for Maryland (Thomas E. Magette, ed.) authored two chapters, November 1988, PPRP-CEIR-6.

Resource Planning and Competitive Bidding for Delmarva Power & Light Company, October 1990, prepared for the Maryland Department of Natural Resources (with M. Fullenbaum).

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The AES Warrior Run Project: Impact on Western Maryland Economic Activity and Electric Rates, February 1993, prepared for the Maryland Power Plant Research Program (with Peter Hall).

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PEPCO's Clean Air Act Compliance Plan: Status Report, prepared for the Maryland Power Plant Research Plan, January 1995 (w/Diane Mountain, Environmental Resources Management, Inc.).

The FERC Open Access Rulemaking: A Review of the Issues, prepared for the Indiana Office of Utility Consumer Counselor and the Pennsylvania Office of Consumer Advocate, June 1995.

A Status Report on Electric Utility Restructuring: Issues for Maryland, prepared for the Maryland Power Plant Research Program, November 1995 (with Daphne Psacharopoulos).

Modeling the Financial Impacts on the Bell Regional Holding Companies from Changes in Access Rates, prepared for MCI Corporation, May 1996.

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The New Hampshire Retail Competition Pilot Program: A Preliminary Evaluation, July 1997, prepared for the Electric Consumers' Alliance (with Jerome D. Mierzwa).

Electric Restructuring and the Environment: Issue Identification for Maryland, March 1997, prepared for the Maryland Power Plant Research Program (with Environmental Resource Management, Inc.)

An Analysis of Electric Utility Embedded Power Supply Costs, prepared for Power-Gen International Conference, Dallas, Texas, December 1997.

Market Power Outlook for Generation Supply in Louisiana, December 2000, prepared for the Louisiana Public Service Commission (with others).

A Review of Issues Concerning Electric Power Capacity Markets, prepared for the Maryland Power Plant Research Program, December 2001 (with B. Hobbs and J. Inon).

Conference and Workshop Presentations:

Workshop on State Load Forecasting Programs, sponsored by the Nuclear Regulatory Commission and Oak Ridge National Laboratory, February 1982 (presentation on forecasting methodology).

Fourteenth Annual Conference of the Michigan State University Institute for Public Utilities, December 1982 (presentation on problems in forecasting).

Conference on Conservation and Load Management, sponsored by the Massachusetts Energy Facilities Siting Council, May 1983 (presentation on cost-benefit criteria).

Maryland Conference on Load Forecasting, sponsored by the Maryland Power Plant Siting Program and the Maryland Public Service Commission, June 1983 (presentation on overforecasting power demands).

The 5th Annual Meetings of the International Association of Energy Economists, June 1983 (presentation on evaluating weatherization programs).

The NARUC Advanced Regulatory Studies Program (presented lectures on capacity planning for electric utilities), February 1984.

The 16th Annual Conference of the Institute of Public Utilities, Michigan State University (discussant on phase-in and excess capacity), December 1984.

U.S. Department of Energy Utilities Conference, Las Vegas, Nevada (presentation of current and future regulatory issues), May 1985.

The 18th Annual Conference of the Institute of Public Utilities, Michigan State University, Williamsburg, Virginia, December 1986 (discussant on cogeneration).

The NRECA Conference on Load Forecasting, sponsored by the National Rural Electric Cooperative Association, New Orleans, Louisiana, December 1987 (presentation on load forecast accuracy).

The Second Rutgers/New Jersey Department of Commerce Annual Conference on Energy Policy in the Middle Atlantic States, Rutgers University, April 1988 (presentation on spot pricing of electricity).

The NASUCA 1988 Mid-Year Meeting, Annapolis, Maryland, June 1988, sponsored by the National Association of State Utility Consumer Advocates (presentation on the FERC electricity avoided cost NOPRs).

The Thirty Second Atlantic Economic Society Conference, Washington, D.C., October 1991 (presentation of a paper on cost of capital issues for the Bell Operating Companies).

The NASUCA 1993 Mid-Year Meeting, St. Louis, Missouri, sponsored by the National Association of State Utility Consumer Advocates, June 1993 (presentation on regulatory issues concerning electric utility mergers).

The NASUCA and NARUC annual meetings in New York City, November 1993 (presentations and panel discussions on the emerging FERC policies on transmission pricing).

The NASUCA annual meetings in Reno, Nevada, November 1994 (presentation concerning the FERC NOPR on stranded cost recovery).

U.S. Department of Energy Utilities/Energy Management Workshop, March 1995 (presentation concerning electric utility competition).

The 1995 NASUCA Mid-Year Meeting, Breckenridge, Colorado, June 1995, (presentation concerning the FERC rulemaking on electric transmission open access).

The 1996 NASUCA Mid-Year Meeting, Chicago, Illinois, June 1996 (presentation concerning electric utility merger issues).

Conference on "Restructuring the Electric Industry," sponsored by the National Consumers League and Electric Consumers Alliance, Washington, D.C., May 1997 (presentation on retail access pilot programs).

The 1997 Mid-Atlantic Conference of Regulatory Utilities Commissioners (MARUC), Hot Springs, Virginia, July 1997 (presentation concerning electric deregulation issues).

Power-Gen '97 International Conference, Dallas, Texas, December 1997 (presentation concerning utility embedded costs of generation supply).

Consumer Summit on Electric Competition, sponsored by the National Consumers League and Electric Consumers' Alliance, Washington, D.C., March 2001 (presentation concerning generation supply and reliability).

National Association of State Utility Consumer Advocates, Mid-Year Meetings, Austin, Texas, June 16-17, 2002 (presenter and panelist on RTO/Standard Market Design issues).

Louisiana State Bar Association, Public Utility Section, October 2, 2002. (Presentation on Performance-Based Ratemaking and panelist on RTO issues). Baton Rouge, Louisiana.

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	Docket Number	Utility	Jurisdiction	Client	Subject
1.	27374 & 27375 October 1978	Long Island Lighting Company	New York Counties	Nassau & Suffolk	Economic impacts of proposed rate increase
2.	6807 January 1978	Generic	Maryland	MD Power Plant Siting Program	Load forecasting
3.	78-676-EL-AIR February 1978	Ohio Power Company	Ohio	Ohio Consumers' Counsel	Test year sales and revenues
4.	17667 May 1979	Alabama Power Company	Alabama	Attorney General	Test year sales, revenues, costs and load forecasts
5.	None April 1980	Tennessee Valley Authority	TVA Board	League of Women Voters	Time-of-use pricing
6.	R-80021082	West Penn Power Company	Pennsylvania	Office of Consumer Advocate	Load forecasting, marginal cost pricing
7.	7259 (Phase I) October 1980	Potomac Edison Company	Maryland	MD Power Plant Siting Program	Load forecasting
8.	7222 December 1980	Delmarva Power & Light Company	Maryland	MD Power Plant Siting Program	Need for plant, load forecasting
9.	7441 June 1981	Potomac Electric Power Company	Maryland	Commission Staff	PURPA standards
10.	7159 May 1980	Baltimore Gas & Electric	Maryland	Commission Staff	Time-of-use pricing
11.	81-044-E-42T	Monongahela Power	West Virginia	Commission Staff	Time-of-use rates
12.	7259 (Phase II) November 1981	Potomac Edison Company	Maryland	MD Power Plant Siting Program	Load forecasting, load management
13.	1606 September 1981	Blackstone Valley Electric and Narragansett	Rhode Island	Division of Public Utilities	PURPA standards
14.	RID 1819 April 1982	Pennsylvania Bell	Pennsylvania	Office of Consumer Advocate	Rate of return
15.	82-0152 July 1982	Illinois Power Company	Illinois	U.S. Department of Defense	Rate of return, CWIP

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16.	7559 September 1982	Potomac Edison Company	Maryland	Commission Staff	Cogeneration
17.	820150-EU September 1982	Gulf Power Company	Florida	Federal Executive Agencies	Rate of return, CWIP
18.	82-057-15 January 1983	Mountain Fuel Supply Company	Utah	Federal Executive Agencies	Rate of return, capital structure
19.	5200 August 1983	Texas Electric Service Company	Texas	Federal Executive Agencies	Cost of equity
20.	28069 August 1983	Oklahoma Natural Gas	Oklahoma	Federal Executive Agencies	Rate of return, deferred taxes, capital structure, attrition
21.	83-0537 February 1984	Commonwealth Edison Company	Illinois	U.S. Department of Energy	Rate of return, capital structure, financial capability
22.	84-035-01 June 1984	Utah Power & Light Company	Utah	Federal Executive Agencies	Rate of return
23.	U-1009-137 July 1984	Utah Power & Light Company	Idaho	U.S. Department of Energy	Rate of return, financial condition
24.	R-842590 August 1984	Philadelphia Electric Company	Pennsylvania	Office of Consumer Advocate	Rate of return
25.	840086-EI August 1984	Gulf Power Company	Florida	Federal Executive Agencies	Rate of return, CWIP
26.	84-122-E August 1984	Carolina Power & Light Company	South Carolina	South Carolina Consumer Advocate	Rate of return, CWIP, load forecasting
27.	CGC-83-G & CGC-84-G October 1984	Columbia Gas of Ohio	Ohio	Ohio Division of Energy	Load forecasting
28.	R-842621 October 1984	Western Pennsylvania Water Company	Pennsylvania	Office of Consumer Advocate	Test year sales
29.	R-842710 January 1985	ALLTEL Pennsylvania Inc.	Pennsylvania	Office of Consumer Advocate	Rate of return

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30.	ER-504 February 1985	Allegheny Generating Company	FERC	Office of Consumer Advocate	Rate of return
31.	R-842632 March 1985	West Penn Power Company	Pennsylvania	Office of Consumer Advocate	Rate of return, conservation, time-of-use rates
32.	83-0537 & 84-0555 April 1985	Commonwealth Edison Company	Illinois	U.S. Department of Energy	Rate of return, incentive rates, rate base
33.	Rulemaking Docket No. 11, May 1985	Generic	Delaware	Delaware Commission Staff	Interest rates on refunds
34.	29450 July 1985	Oklahoma Gas & Electric Company	Oklahoma	Oklahoma Attorney General	Rate of return, CWIP in rate base
35.	1811 August 1985	Bristol County Water Company	Rhode Island	Division of Public Utilities	Rate of return, capital structure
36.	R-850044 & R-850045 August 1985	Quaker State & Continental Telephone Companies	Pennsylvania	Office of Consumer Advocate	Rate of return
37.	R-850174 November 1985	Philadelphia Suburban Water Company	Pennsylvania	Office of Consumer Advocate	Rate of return, financial conditions
38.	U-1006-265 March 1986	Idaho Power Company	Idaho	U.S. Department of Energy	Power supply costs and models
39.	EL-86-37 & EL-86-38 September 1986	Allegheny Generating Company	FERC	PA Office of Consumer Advocate	Rate of return
40.	R-850287 June 1986	National Fuel Gas Distribution Corp.	Pennsylvania	Office of Consumer Advocate	Rate of return
41.	1849 August 1986	Blackstone Valley Electric	Rhode Island	Division of Public Utilities	Rate of return, financial condition
42.	86-297-GA-AIR November 1986	East Ohio Gas Company	Ohio	Ohio Consumers' Counsel	Rate of return
43.	U-16945 December 1986	Louisiana Power & Light Company	Louisiana	Public Service Commission	Rate of return, rate phase-in plan

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44.	Case No. 7972 February 1987	Potomac Electric Power Company	Maryland	Commission Staff	Generation capacity planning, purchased power contract
45.	EL-86-58 & EL-86-59 March 1987	System Energy Resources and Middle South Services	FERC	Louisiana PSC	Rate of return
46.	ER-87-72-001 April 1987	Orange & Rockland	FERC	PA Office of Consumer Advocate	Rate of return
47.	U-16945 April 1987	Louisiana Power & Light Company	Louisiana	Commission Staff	Revenue requirement update phase-in plan
48.	P-870196 May 1987	Pennsylvania Electric Company	Pennsylvania	Office of Consumer Advocate	Cogeneration contract
49.	86-2025-EL-AIR June 1987	Cleveland Electric Illuminating Company	Ohio	Ohio Consumers' Counsel	Rate of return
50.	86-2026-EL-AIR June 1987	Toledo Edison Company	Ohio	Ohio Consumers' Counsel	Rate of return
51.	87-4 June 1987	Delmarva Power & Light Company	Delaware	Commission Staff	Cogeneration/small power
52.	1872 July 1987	Newport Electric Company	Rhode Island	Commission Staff	Rate of return
53.	WO 8606654 July 1987	Atlantic City Sewerage Company	New Jersey	Resorts International	Financial condition
54.	7510 August 1987	West Texas Utilities Company	Texas	Federal Executive Agencies	Rate of return, phase-in
55.	8063 Phase I October 1987	Potomac Electric Power Company	Maryland	Power Plant Research Program	Economics of power plant site selection
56.	00439 November 1987	Oklahoma Gas & Electric Company	Oklahoma	Smith Cogeneration	Cogeneration economics
57.	RP-87-103 February 1988	Panhandle Eastern Pipe Line Company	FERC	Indiana Utility Consumer Counselor	Rate of return

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58.	EC-88-2-000 February 1988	Utah Power & Light Co. PacifiCorp	FERC	Nucor Steel	Merger economics
59.	87-0427 February 1988	Commonwealth Edison Company	Illinois	Federal Executive Agencies	Financial projections
60.	870840 February 1988	Philadelphia Suburban Water Company	Pennsylvania	Office of Consumer Advocate	Rate of return
61.	870832 March 1988	Columbia Gas of Pennsylvania	Pennsylvania	Office of Consumer Advocate	Rate of return
62.	8063 Phase II July 1988	Potomac Electric Power Company	Maryland	Power Plant Research Program	Power supply study
63.	8102 July 1988	Southern Maryland Electric Cooperative	Maryland	Power Plant Research Program	Power supply study
64.	10105 August 1988	South Central Bell Telephone Co.	Kentucky	Attorney General	Rate of return, incentive regulation
65.	00345 August 1988	Oklahoma Gas & Electric Company	Oklahoma	Smith Cogeneration	Need for power
66.	U-17906 September 1988	Louisiana Power & Light Company	Louisiana	Commission Staff	Rate of return, nuclear power costs Industrial contracts
67.	88-170-EL-AIR October 1988	Cleveland Electric Illuminating Co.	Ohio	Northeast-Ohio Areawide Coordinating Agency	Economic impact study
68.	1914 December 1988	Providence Gas Company	Rhode Island	Commission Staff	Rate of return
69.	U-12636 & U-17649 February 1989	Louisiana Power & Light Company	Louisiana	Commission Staff	Disposition of litigation proceeds
70.	00345 February 1989	Oklahoma Gas & Electric Company	Oklahoma	Smith Cogeneration	Load forecasting
71.	RP88-209 March 1989	Natural Gas Pipeline of America	FERC	Indiana Utility Consumer Counselor	Rate of return

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72.	8425 March 1989	Houston Lighting & Power Company	Texas	U.S. Department of Energy	Rate of return
73.	EL89-30-000 April 1989	Central Illinois Public Service Company	FERC	Soyland Power Coop, Inc.	Rate of return
74.	R-891208 May 1989	Pennsylvania American Water Company	Pennsylvania	Office of Consumer Advocate	Rate of return
75.	89-0033 May 1989	Illinois Bell Telephone Company	Illinois	Citizens Utility Board	Rate of return
76.	881167-EI May 1989	Gulf Power Company	Florida	Federal Executive Agencies	Rate of return
77.	R-891218 July 1989	National Fuel Gas Distribution Company	Pennsylvania	Office of Consumer Advocate	Sales forecasting
78.	8063, Phase III Sept. 1989	Potomac Electric Power Company	Maryland	Depart. Natural Resources	Emissions Controls
79.	37414-S2 October 1989	Public Service Company of Indiana	Indiana	Utility Consumer Counselor	Rate of return, DSM, off-system sales, incentive regulation
80.	October 1989	Generic	U.S. House of Reps. Comm. on Ways & Means	NA	Excess deferred income tax
81.	38728 November 1989	Indiana Michigan Power Company	Indiana	Utility Consumer Counselor	Rate of return
82.	RP89-49-000 December 1989	National Fuel Gas Supply Corporation	FERC	PA Office of Consumer Advocate	Rate of return
83.	R-891364 December 1989	Philadelphia Electric Company	Pennsylvania	PA Office of Consumer Advocate	Financial impacts (surrebuttal only)
84.	RP89-160-000 January 1990	Trunkline Gas Company	FERC	Indiana Utility Consumer Counselor	Rate of return

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85.	EL90-16-000 November 1990	System Energy Resources, Inc.	FERC	Louisiana Public Service Commission	Rate of return
86.	89-624 March 1990	Bell Atlantic	FCC	PA Office of Consumer Advocate	Rate of return
87.	8245 March 1990	Potomac Edison Company	Maryland	Depart. Natural Resources	Avoided Cost
88.	000586 March 1990	Public Service Company of Oklahoma	Oklahoma	Smith Cogeneration Mgmt.	Need for Power
89.	38868 March 1990	Indianapolis Water Company	Indiana	Utility Consumer Counselor	Rate of return
90.	1946 March 1990	Blackstone Valley Electric Company	Rhode Island	Division of Public Utilities	Rate of return
91.	000776 April 1990	Oklahoma Gas & Electric Company	Oklahoma	Smith Cogeneration Mgmt.	Need for Power
92.	890366 May 1990, December 1990	Metropolitan Edison Company	Pennsylvania	Office of Consumer Advocate	Competitive Bidding Program Avoided Costs
93.	EC-90-10-000 May 1990	Northeast Utilities	FERC	Maine PUC, et. al.	Merger, Market Power, Transmission Access
94.	ER-891109125 July 1990	Jersey Central Power & Light	New Jersey	Rate Counsel	Rate of return
95.	R-901670 July 1990	National Fuel Gas Distribution Corp.	Pennsylvania	Office of Consumer Advocate	Rate of return Test year sales
96.	8201 October 1990	Delmarva Power & Light Company	Maryland	Depart. Natural Resources	Competitive Bidding, Resource Planning
97.	EL90-45-000 April 1991	Entergy Services, Inc.	FERC	Louisiana PSC	Rate of return
98.	GR90080786J January 1991	New Jersey Natural Gas	New Jersey	Rate Counsel	Rate of return

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99.	90-256 January 1991	South Central Bell Telephone Co.	Kentucky	Attorney General	Rate of return
100.	U-17949A February 1991	South Central Bell Telephone Co.	Louisiana	Louisiana PSC	Rate of return
101.	ER90091090J April 1991	Atlantic City Electric Company	New Jersey	Rate Counsel	Rate of return
102.	8241, Phase I April 1991	Baltimore Gas & Electric Co.	Maryland	Dept. of Natural Resources	Environmental controls
103.	8241, Phase II May 1991	Baltimore Gas & Electric Company	Maryland	Dept. of Natural Resources	Need for Power, Resource Planning
104.	39128 May 1991	Indianapolis Water Company	Indiana	Utility Consumer Counselor	Rate of return, rate base, financial planning
105.	P-900485 May 1991	Duquesne Light Company	Pennsylvania	Office of Consumer Advocate	Purchased power contract and related ratemaking
106.	G900240 P910502 May 1991	Metropolitan Edison Co. Pennsylvania Electric Co.	Pennsylvania	Office of Consumer Advocate	Purchased power contract and related ratemaking
107.	GR901213915 May 1991	Elizabethtown Gas Co.	New Jersey	Rate Counsel	Rate of return
108.	91-5032 August 1991	Nevada Power Co.	Nevada	U.S. Dept. of Energy	Rate of return
109.	EL90-48-000 November 1991	Entergy Services	FERC	Louisiana PSC	Capacity transfer
110.	000662 September 1991	Southwestern Bell Telephone	Oklahoma	Attorney General	Rate of return
111.	U-19236 October 1991	Arkansas Louisiana Gas Company	Louisiana	Louisiana PSC Staff	Rate of return
112.	U-19237 December 1991	Louisiana Gas Service Company	Louisiana	Louisiana PSC Staff	Rate of return

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113.	ER91030356J October 1991	Rockland Electric Company	New Jersey	Rate Counsel	Rate of return
114.	GR91071243J February 1992	South Jersey Gas Company	New Jersey	Rate Counsel	Rate of return
115.	GR91081393J March 1992	New Jersey Natural Gas Company	New Jersey	Rate Counsel	Rate of return
116.	P-870235 et al. March 1992	Pennsylvania Electric Company	Pennsylvania	Office of Consumer Advocate	Cogeneration contracts
117.	8413 March 1992	Potomac Electric Power Company	Maryland	Dept. of Natural Resources	IPP purchased power contracts
118.	39236 March 1992	Indianapolis Power & Light Company	Indiana	Utility Consumer Counselor	Least-cost planning Need for power
119.	R-912164 April 1992	Equitable Gas Company	Pennsylvania	Office of Consumer Advocate	Rate of return
120.	ER-91111698J May 1992	Public Service Electric & Gas Company	New Jersey	Rate Counsel	Rate of return
121.	U-19631 June 1992	Trans Louisiana Gas Company	Louisiana	PSC Staff	Rate of return
122.	ER-91121820J July 1992	Jersey Central Power & Light Company	New Jersey	Rate Counsel	Rate of return
123.	R-00922314 August 1992	Metropolitan Edison Company	Pennsylvania	Office of Consumer Advocate	Rate of return
124.	92-049-05 September 1992	US West Communications	Utah	Committee of Consumer Services	Rate of return
125.	92PUE0037 September 1992	Commonwealth Gas Company	Virginia	Attorney General	Rate of return
126.	EC92-21-000 September 1992	Entergy Services, Inc.	FERC	Louisiana PSC	Merger Impacts (Affidavit)

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127.	ER92-341-000 December 1992	System Energy Resources	FERC	Louisiana PSC	Rate of return
128.	U-19904 November 1992	Louisiana Power & Light Company	Louisiana	Staff	Merger analysis, competition competition issues
129.	8473 November 1992	Baltimore Gas & Electric Company	Maryland	Dept. of Natural Resources	QF contract evaluation
130.	IPC-E-92-25 January 1993	Idaho Power Company	Idaho	Federal Executive Agencies	Power supply clause
131.	E002/GR-92-1185 February 1993	Northern States Power Company	Minnesota	Attorney General	Rate of return
132.	92-102, Phase II March 1992	Central Maine Power Company	Maine	Staff	QF contracts prudence and procurements practices
133.	EC92-21-000 March 1993	Entergy Corporation	FERC	Louisiana PSC	Merger issues
134.	8489 March 1993	Delmarva Power & Light Company	Maryland	Dept. of Natural Resources	Power plant certification
135.	11735 April 1993	Texas Electric Utilities Company	Texas	Federal Executives Agencies	Rate of return
136.	2082 May 1993	Providence Gas Company	Rhode Island	Division of Public Utilities	Rate of return
137.	P-00930715 December 1993	Bell Telephone Co. of Pennsylvania	Pennsylvania	Office of Consumer Advocate	Rate of return, financial projections, Bell/TCI merger
138.	R-00932670 February 1994	Pennsylvania-American Water Company	Pennsylvania	Office of Consumer Advocate	Rate of return
139.	8583 February 1994	Conowingo Power Co.	Maryland	Dept. of Natural Resources	Competitive bidding for power supplies
140.	E-015/GR-94-001 April 1994	Minnesota Power & Light Co.	Minnesota	Attorney General	Rate of return

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141.	CC Docket No. 94-1 May 1994	Generic Telephone	FCC	MCI Comm. Corp.	Rate of return
142.	92-345, Phase II June 1994	Central Maine Power Co.	Maine	Advocacy Staff	Price Cap Regulation Fuel Costs
143.	93-11065 April 1994	Nevada Power Co.	Nevada	Federal Executive Agencies	Rate of return
144.	94-0065 May 1994	Commonwealth Edison Co.	Illinois	Federal Executive Agencies	Rate of return
145.	GR94010002J June 1994	South Jersey Gas Co.	New Jersey	Rate Counsel	Rate of return
146.	WR94030059 July 1994	New Jersey-American Water Co.	New Jersey	Rate Counsel	Rate of return
147.	RP91-203-000 June 1994	Tennessee Gas Pipeline Company	FERC	Customer Group	Environmental Externalities (oral testimony only)
148.	ER94-998-000 July 1994	Ocean State Power	FERC	Boston Edison Co.	Rate of return
149.	R-00942986 July 1994	West Penn Power Co.	Pennsylvania	Office of Consumer Advocate	Rate of return, emission allowances
150.	94-121 August 1994	South Central Bell Telephone Co.	Kentucky	Attorney General	Rate of return
151.	35854-S2 November 1994	PSI Energy, Inc.	Indiana	Utility Consumer Counsel	Merger savings and allocations
152.	IPC-E-94-5 November 1994	Idaho Power Co.	Idaho	Federal Executive Agencies	Rate of return
153.	November 1994	Edmonton Water	Alberta, Canada	Regional Customer Group	Rate of return (rebuttal only)
154.	90-256 December 1994	South Central Bell Telephone Co.	Kentucky	Attorney General	Incentive Plan True-Ups

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155.	U-20925 February 1995	Louisiana Power & Light Company	Louisiana	PSC Staff	Rate of return Industrial contracts Trust fund earnings
156.	R-00943231 February 1995	Pennsylvania-American Water Company	Pennsylvania	Consumer Advocate	Rate of return
157.	8678 March 1995	Generic	Maryland	Dept. Natural Resources	Electric Competition Incentive Regulation (oral only)
158.	R-000943271 April 1995	Pennsylvania Power & Light Company	Pennsylvania	Consumer Advocate	Rate of return Nuclear decommissioning Capacity Issues
159.	U-20925 May 1995	Louisiana Power & Light Company	Louisiana	Commission Staff	Class cost of service issues
160.	2290 June 1995	Narragansett Electric Company	Rhode Island	Division Staff	Rate of return
161.	U-17949E June 1995	South Central Bell Telephone Company	Louisiana	Commission Staff	Rate of return
162.	2304 July 1995	Providence Water Supply Board	Rhode Island	Division Staff	Cost recovery of capital spending program
163.	ER95-625-000 et al. August 1995	PSI Energy, Inc.	FERC	Office of Utility Consumer Counselor	Rate of return
164.	P-00950915 et al. September 1995	Paxton Creek Cogeneration Assoc.	Pennsylvania	Office of Consumer Advocate	Cogeneration contract amendment
165.	8702 September 1995	Potomac Edison Company	Maryland	Dept. of Natural Resources	Allocation of DSM Costs (oral only)
166.	ER95-533-001 September 1995	Ocean State Power	FERC	Boston Edison Co.	Cost of equity
167.	40003 November 1995	PSI Energy, Inc.	Indiana	Utility Consumer Counselor	Rate of return Retail wheeling

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168.	P-55, SUB 1013 January 1996	BellSouth	North Carolina	AT&T	Rate of return
169.	P-7, SUB 825 January 1996	Carolina Tel.	North Carolina	AT&T	Rate of return
170.	February 1996	Generic Telephone	FCC	MCI	Cost of capital
171.	95A-531EG April 1996	Public Service Company of Colorado	Colorado	Federal Executive Agencies	Merger issues
172.	ER96-399-000 May 1996	Northern Indiana Public Service Company	FERC	Indiana Office of Utility Consumer Counselor	Cost of capital
173.	8716 June 1996	Delmarva Power & Light Company	Maryland	Dept. of Natural Resources	DSM programs
174.	8725 July 1996	BGE/PEPCO	Maryland	Md. Energy Admin.	Merger Issues
175.	U-20925 August 1996	Entergy Louisiana, Inc.	Louisiana	PSC Staff	Rate of return Allocations Fuel Clause
176.	EC96-10-000 September 1996	BGE/PEPCO	FERC	Md. Energy Admin.	Merger issues competition
177.	EL95-53-000 November 1996	Entergy Services, Inc.	FERC	Louisiana PSC	Nuclear Decommissioning
178.	WR96100768 March 1997	Consumers NJ Water Company	New Jersey	Ratepayer Advocate	Cost of Capital
179.	WR96110818 April 1997	Middlesex Water Co.	New Jersey	Ratepayer Advocate	Cost of Capital
180.	U-11366 April 1997	Ameritech Michigan	Michigan	MCI	Access charge reform/financial condition
181.	97-074 May 1997	BellSouth	Kentucky	MCI	Rate Rebalancing financial condition

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182.	2540 June 1997	New England Power	Rhode Island	PUC Staff	Divestiture Plan
183.	96-336-TP-CSS June 1997	Ameritech Ohio	Ohio	MCI	Access Charge reform Economic impacts
184.	WR97010052 July 1997	Maxim Sewerage Corp.	New Jersey	Ratepayer Advocate	Rate of Return
185.	97-300 August 1997	LG&E/KU	Kentucky	Attorney General	Merger Plan
186.	Case No. 8738 August 1997	Generic (oral testimony only)	Maryland	Dept. of Natural Resources	Electric Restructuring Policy
187.	Docket No. 2592 September 1997	Eastern Utilities	Rhode Island	PUC Staff	Generation Divestiture
188.	Case No.97-247 September 1997	Cincinnati Bell Telephone	Kentucky	MCI	Financial Condition
189.	Docket No. U-20925 November 1997	Entergy Louisiana	Louisiana	PSC Staff	Rate of Return
190.	Docket No. D97.7.90 November 1997	Montana Power Co.	Montana	Montana Consumers Counsel	Stranded Cost
191.	Docket No. EO97070459 November 1997	Jersey Central Power & Light Co.	New Jersey	Ratepayer Advocate	Stranded Cost
192.	Docket No. R-00974104 November 1997	Duquesne Light Co.	Pennsylvania	Office of Consumer Advocate	Stranded Cost
193.	Docket No. R-00973981 November 1997	West Penn Power Co.	Pennsylvania	Office of Consumer Advocate	Stranded Cost
194.	Docket No. A-1101150F0015 November 1997	Allegheny Power System DQE, Inc.	Pennsylvania	Office of Consumer Advocate	Merger Issues
195.	Docket No. WR97080615 January 1998	Consumers NJ Water Company	New Jersey	Ratepayer Advocate	Rate of Return

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196.	Docket No. R-00974149 January 1998	Pennsylvania Power Company	Pennsylvania	Office of Consumer Advocate	Stranded Cost
197.	Case No. 8774 January 1998	Allegheny Power System DQE, Inc.	Maryland	Dept. of Natural Resources MD Energy Administration	Merger Issues
198.	Docket No. U-20925 (SC) March 1998	Entergy Louisiana, Inc.	Louisiana	Commission Staff	Restructuring, Stranded Costs, Market Prices
199.	Docket No. U-22092 (SC) March 1998	Entergy Gulf States, Inc.	Louisiana	Commission Staff	Restructuring, Stranded Costs, Market Prices
200.	Docket Nos. U-22092 (SC) and U-20925(SC) May 1998	Entergy Gulf States and Entergy Louisiana	Louisiana	Commission Staff	Standby Rates
201.	Docket No. WR98010015 May 1998	NJ American Water Co.	New Jersey	Ratepayer Advocate	Rate of Return
202.	Case No. 8794 December 1998	Baltimore Gas & Electric Co.	Maryland	MD Energy Admin./Dept. Of Natural Resources	Stranded Cost/ Transition Plan
203.	Case No. 8795 December 1998	Delmarva Power & Light Co.	Maryland	MD Energy Admin./Dept. Of Natural Resources	Stranded Cost/ Transition Plan
204.	Case No. 8797 January 1998	Potomac Edison Co.	Maryland	MD Energy Admin./Dept. Of Natural Resources	Stranded Cost/ Transition Plan
205.	Docket No. WR98090795 March 1999	Middlesex Water Co.	New Jersey	Ratepayer Advocate	Rate of Return
206.	Docket No. 99-02-05 April 1999	Connecticut Light & Power	Connecticut	Attorney General	Stranded Costs
207.	Docket No. 99-03-04 May 1999	United Illuminating Company	Connecticut	Attorney General	Stranded Costs
208.	Docket No. U-20925 (FRP) June 1999	Entergy Louisiana, Inc.	Louisiana	Staff	Capital Structure
209.	Docket No. EC-98-40-000 et. al. May 1999	American Electric Power/ Central & Southwest	FERC	Arkansas PSC	Market Power Mitigation

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210.	Docket No. 99-03-35 July 1999	United Illuminating Company	Connecticut	Attorney General	Restructuring
211.	Docket No. 99-03-36 July 1999	Connecticut Light & Power Co.	Connecticut	Attorney General	Restructuring
212.	WR99040249 Oct. 1999	Environmental Disposal Corp.	New Jersey	Ratepayer Advocate	Rate of Return
213.	2930 Nov. 1999	NEES/EUA	Rhode Island	Division Staff	Merger/Cost of Capital
214.	DE99-099 Nov. 1999	Public Service New Hampshire	New Hampshire	Consumer Advocate	Cost of Capital Issues
215.	00-01-11 Feb. 2000	Con Ed/NU	Connecticut	Attorney General	Merger Issues
216.	Case No. 8821 May 2000	Reliant/ODEC	Maryland	Dept. of Natural Resources	Need for Power/Plant Operations
217.	Case No. 8738 July 2000	Generic	Maryland	Dept. of Natural Resources	DSM Funding
218.	Case No. U-23356 June 2000	Entergy Louisiana, Inc.	Louisiana	PSC Staff	Fuel Prudence Issues Purchased Power
219.	Case No. 21453 et. al July 2000	SWEPCO	Louisiana	PSC Staff	Stranded Costs
220.	Case No. 20925 (B) July 2000	Entergy Louisiana	Louisiana	PSC Staff	Purchase Power Contracts
221.	Case No. 24889 August 2000	Entergy Louisiana	Louisiana	PSC Staff	Purchase Power Contracts
222.	Case No. 21453 et. al. February 2001	CLECO	Louisiana	PSC Staff	Stranded Costs
223.	P-00001860 and P-0000181 March 2001	GPU Companies	Pennsylvania	Office of Consumer Advocate	Rate of Return

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224.	CVOL-0505662-S March 2001	ConEd/NU	Connecticut Superior Court	Attorney General	Merger (Affidavit)
225.	U-20925 (SC) March 2001	Entergy Louisiana	Louisiana	PSC Staff	Stranded Costs
226.	U-22092 (SC) March 2001	Entergy Gulf States	Louisiana	PSC Staff	Stranded Costs
227.	U-25533 May 2001	Entergy Louisiana/ Gulf States	Louisiana Interruptible Service	PSC Staff	Purchase Power
228.	P-00011872 May 2001	Pike County Pike	Pennsylvania	Office of Consumer Advocate	Rate of Return
229.	8893 July 2001	Baltimore Gas & Electric Co.	Maryland	MD Energy Administration	Corporate Restructuring
230.	8890 September 2001	Potomac Electric/Conectiv	Maryland	MD Energy Administration	Merger Issues
231.	U-25533 August 2001	Entergy Louisiana / Gulf States	Louisiana	Staff	Purchase Power Contracts
232.	U-25965 November 2001	Generic	Louisiana	Staff	RTO Issues
233.	3401 March 2002	New England Gas Co.	Rhode Island	Division of Public Utilities	Rate of Return
234.	99-833-MJR April 2002	Illinois Power Co.	U.S. District Court	U.S. Department of Justice	New Source Review
235.	U-25533 March 2002	Entergy Louisiana/ Gulf States	Louisiana	PSC Staff	Nuclear Uprates Purchase Power
236.	P-00011872 May 2002	Pike County Power & Light	Pennsylvania	Consumer Advocate	POLR Service Costs
237.	U-26361, Phase I May 2002	Entergy Louisiana/ Gulf States	Louisiana	PSC Staff	Purchase Power Cost Allocations

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238.	R-00016849C001 et al. June 2002	Generic	Pennsylvania	Pennsylvania OCA	Rate of Return
239.	U-26361, Phase II July 2002	Entergy Louisiana/ Entergy Gulf States	Louisiana	PSC Staff	Purchase Power Contracts
240.	U-20925(B) August 2002	Entergy Louisiana	Louisiana	PSC Staff	Tax Issues
241.	U-26531 October 2002	SWEPCO	Louisiana	PSC Staff	Purchase Power Contract
242.	8936 October 2002	Delmarva Power & Lt.	Maryland	Energy Administration Dept. Natural Resources	Standard Offer Service
243.	U-25965 November 2002	SWEPCO/AEP	Louisiana	PSC Staff	RTO Cost/Benefit
244.	8908 Phase I November 2002	Generic	Maryland	Energy Administration Dept. Natural Resources	Standard Offer Service
245.	02S-315EG November 2002	Public Service Co. of Colorado	Colorado	Fed. Executive Agencies	Rate of Return
246.	EL02-111-000 December 2002	PJM/MISO	FERC	MD PSC	Transmission Ratemaking
247.	02-0479 February 2003	Commonwealth Edison	Illinois	Dept. of Energy	POLR Service
248.	PL03-1-000 March 2003	Generic	FERC	NASUCA	Transmission Pricing (Affidavit)
249.	U-27136 April 2003	Entergy Louisiana	Louisiana	Staff	Purchase Power Contracts
250.	8908 Phase II July 2003	Generic	Maryland	Energy Admin. Dept. of Natural Resources	Standard Offer Service
251.	U-27192 June 2003	Entergy Louisiana and Gulf States	Louisiana	LPSC Staff	Purchase Power Contract Cost Recovery

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252.	C2-99-1181 October 2003	Ohio Edison Co.	U.S. District Court	U.S. Department of Justice et. al.	Clean Air Act Compliance Economic Impact
253.	RP03-398-000 December 2003	Northern Natural Gas Co.	FERC	Municipal Distributors Group/Gas Task Force	Rate of Return
254.	8738 December 2003	Generic	Maryland	Energy Admin Department of Natural Resources	Environmental Disclosure (oral only)
255.	U-27136 December 2003	Entergy Louisiana, Inc.	Louisiana	PSC Staff	Purchase Power Contracts
256.	U-27192, Phase II October/December 2003	Entergy Louisiana & Entergy Gulf States	Louisiana	PSC Staff	Purchase Power Contracts
257.	WC Docket 03-173	Generic	FCC	MCI	Cost of Capital
25.8	ER 030 20110 January 2004	Atlantic City Electric	New Jersey	Ratepayer Advocate	Rate of Return
259.	E-01345A-03-0437 January 2004	Arizona Public Service Co.	Arizona	Federal Executive Agencies	Rate of Return